

What is claimed is:

- 1 1. A floating and self-aligning suspension system, comprising:
2 a frame including first and second base members extending substantially
3 parallel to one another and a stanchion member extending from each end of the first and
4 second base members;
5 at least two plunger assemblies attached to each of the first and second
6 base members and extending from the first and second base members in a direction
7 substantially opposite to the stanchion members to permit movement of the frame along
8 a first axis relative to an assembly;
9 at least one other plunger assembly attached to each stanchion member
10 and extending from each stanchion member to permit movement of the frame along at
11 least a second axis relative to the assembly; and
12 a connector mounted to the frame, wherein the frame is movable along at
13 least the first and second axes for self alignment and attachment of the connector to the
14 assembly.
- 1 2. The floating and self-aligning suspension system of claim 1, wherein each
2 plunger assembly comprises:
3 a body;
4 a hole formed through the body, the hole having a smaller opening at one
5 end of the body;
6 a plunger disposed in the hole and including one end extending a
7 predetermined length out of the smaller opening and an opposite end with a lip for
8 contacting an interior edge of the smaller opening of the hole to retain the plunger
9 within the hole;
10 a spring disposed within the hole in contact with the lip end of the
11 plunger to bias the plunger and force the one end to extend out of the smaller opening;
12 and
a retaining cap to retain the spring and plunger within the body.

1 3. The floating and self-aligning suspension system of claim 2, wherein the body of
2 the plunger assembly is substantially cylindrical and an exterior of the body is
3 threaded for attachment to the frame.

1 4. The floating and self-aligning suspension system of claim 2, wherein the plunger
2 assembly includes a locking feature to adjust the predetermined length of the
3 plunger extending out of the smaller opening.

1 5. The floating and self-aligning suspension system of claim 1, further comprising:
2 a bank of capacitors mounted to the frame; and
3 a cable connecting the bank of capacitors to the connector, wherein the
4 bank of capacitors and the cable are moveable along at least the two axes of motion with
5 the frame to permit the connector to electrically connect the bank of capacitors to the
6 assembly.

1 6. The floating and self-aligning suspension system of claim 5, wherein the bank of
2 capacitors is coupleable to an external power supply.

1 7. The floating and self-aligning suspension system of claim 1, further comprising
2 an outer frame within which the frame is disposed, wherein the frame can move
3 relative to the outer frame to permit alignment of the connector to a mating
4 connector on the assembly.

1 8. The floating and self-aligning suspension system of claim 1, wherein the
2 assembly is a central processing unit including a plurality of signal pins
3 extending in one direction and a power tab extending in another direction for
4 attachment to the connector.

1 9. The floating and self-aligning suspension system of claim 1, wherein the
2 assembly comprises a integrated circuit including a pin array extending in one

3 direction and a tab extending in another direction to require multiple directions
4 of motion to socket the pin array and tab of the integrated circuit and wherein
5 the frame is movable to permit the connector to self-align and connect to the tab
6 of the integrated circuit.

1 10. A system for testing an integrated circuit, comprising:
2 a motherboard;
3 a socket mounted on the motherboard to connect to a plurality of pins of
4 the integrated circuit;
5 a floating and self-aligning suspension system; and
6 a connector mounted to the floating and self-aligning suspension system,
7 wherein the floating and self-aligning suspension system permits the connector to move
8 along at least one axis for self-alignment and attachment to a tab extending from the
9 integrated circuit.

1 11. The system of claim 10, wherein the floating and self-aligning suspension
2 system comprises:
3 an outer frame;
4 an inner frame disposed within the outer frame, the connector being
5 mounted to the inner frame; and
6 a biasing mechanism attached to the inner frame to allow movement of
7 the inner frame relative to the outer frame.

1 12. The system of claim 11, wherein the biasing mechanism comprises a plurality of
2 plunger assemblies attached to the inner frame.

1 13. The system of claim 10, further comprising:
2 a bank of capacitors mounted to the floating and self-aligning suspension
3 system; and

4 a multiple conductor cable connecting the bank of capacitors to the
5 connector, wherein the bank of capacitors and the cable are moveable along at least one
6 axis of motion by the floating and self-aligning suspension system to permit the
7 connector to electrically connect the bank of capacitors to the integrated circuit.

1 14. The system of claim 13, wherein the bank of capacitors is coupleable to an
2 external power supply, and wherein the bank of capacitors conditions a power
3 signal from the external power supply before application to the integrated
4 circuit.

1 15. The system of claim 13, wherein the bank of capacitors and the cable must be
2 able to carry at least 100 amps of current.

1 16. The system of claim 10, further comprising an actuator to move the floating and
2 self-aligning suspension system for self-alignment and attachment of the
3 connector to the integrated circuit.

1 17. A floating and self-aligning suspension system, comprising
2 a frame;
3 a biasing mechanism mounted to the frame to permit the frame to move
4 relative to another structure; and
5 a connector mounted to the frame and movable with the frame for self-
6 alignment and attachment to an assembly.

1 18. The floating and self-aligning suspension system of claim 17, wherein the
2 biasing mechanism is a plunger assembly.

1 19. The floating and self-aligning suspension system of claim 17, further
2 comprising:
3 a bank of capacitors mounted to the frame; and

4 a cable connecting the bank of capacitors to the connector.

1 20. The floating and self-aligning suspension system of claim 17, wherein the other
2 structure is an outer frame into which the frame is disposed.

1 21. The floating and self-aligning suspension system of claim 20, further comprising
2 an actuator to move the outer frame, wherein the frame and connector will move
3 independent of the outer frame to self-align and attach the connector to a power
4 tab of the assembly.

1 22. The suspension system of claim 21, wherein the assembly is an integrated circuit
2 having an array of signal pins extending in one direction and a power tab
3 extending in another direction for attachment to the connector.

1 23. The suspension system of claim 17, wherein the frame comprises:
2 a first base member;
3 a second base member;
4 at least one cross-member connected to the first and second base
5 members; and
6 a plurality of stanchion members, one stanchion member extending from
7 each end of the first and second base members; and wherein the biasing mechanism
8 comprises:
9 at least two plunger assemblies attached to each of the first and second
10 base members and extending outwardly from the frame to contact the outer frame; and
11 a plunger assembly attached to each stanchion member and extending
12 outwardly from the frame to contact the outer frame.

1 24. A method of making a floating and self-aligning suspension system, comprising:
2 forming an inner frame;
3 attaching a biasing arrangement to the inner frame;

4 mounting a connector to the inner frame;
5 forming an outer frame; and
6 disposing the inner frame within the outer frame, wherein the biasing
7 arrangement permits the inner frame to move relative to the outer frame.

1 25. The method of claim 24, wherein attaching the biasing arrangement comprises
2 attaching a plurality of plunger assemblies to the inner frame to contact the outer
3 frame when the inner frame is disposed within the outer frame.

1 26. The method of claim 24, wherein forming the inner frame comprises:
2 forming a first substantially U-shaped frame member;
3 forming a second substantially U-shaped frame member;
4 forming at least one cross-member; and
5 connecting the first and second substantially U-shaped frame members
6 together with the at least one cross-member.

1 27. The method of claim 24, further comprising:
2 attaching a cable including a plurality of conductors to the connector;
3 mounting a bank of capacitors to the inner frame; and
4 attaching the cable to the bank of capacitors.

1 28. A method of making a test system for an integrated circuit, comprising:
2 providing a motherboard;
3 mounting a socket on the motherboard to receive an array of signal pins
4 of an integrated circuit to be tested; and
5 forming a floating and self-aligning suspension system to align and
6 connect a connector to a tab of the integrated circuit, wherein the tab extends from the
7 integrated circuit in a direction different from the array of pins.

1 29. The method of claim 28, wherein forming the floating and self-aligning
2 suspension system comprises:
3 forming an inner frame;
4 attaching a biasing arrangement to the inner frame;
5 mounting the connector to the inner frame;
6 forming an outer frame; and
7 disposing the inner frame within the outer frame, wherein the biasing
8 arrangement permits the inner frame to move relative to the outer frame to allow the
9 connector to self-align and attach to the tab of the integrated circuit.

1 30. The method of claim 28, wherein attaching the biasing arrangement comprises
2 attaching a plurality of plunger assemblies to the inner frame, each plunger
3 assembly including a movable, biased plunger to contact the outer frame when
4 the inner frame is disposed within the outer frame.

1 31. The method of claim 28, further comprising:
2 attaching a cable including a plurality of conductors to the connector;
3 mounting a bank of capacitors to the inner frame; and
4 attaching the cable to the bank of capacitors.